

**Remarks**

Claims 24 to 35 were canceled without prejudice in previous Amendments.

Claims 1-23 are before the Examiner for consideration.

**Rejection Under 35 U.S.C. §103(a)**

Claims 1-23 have been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,670,255 to Temple, *et al.* ("Temple") or U.S. Patent No. 5,824,413 to Schell ("Schell"), each in view of U.S. Patent Publication No. 2004/0265586 to Gonthier, *et al.* ("Gonthier") and U.S. Patent No. 4,477,496 to Das, *et al.* ("Das"). The Examiner asserts that Temple teaches a glass strand coated with an aqueous composition that includes film formers such as polyesters, polyurethanes, vinyl polymers, and mixtures thereof. In addition, it is asserted that Temple teaches that the vinyl polymer can be polyvinyl acetate. With respect to Schell, the Examiner asserts that Schell teaches glass strands coated with an aqueous composition that includes a polyurethane. It is also asserted that Schell teaches that additional film formers such as polyester and vinyl polymers can be present in the composition. Further, the Examiner asserts that the vinyl polymer in Schell can be polyvinyl acetate. The Examiner admits that Temple and Schell do not teach the specific formation of the polyester polymer, the molecular weight of each component, or the specific amounts of each component.

In this regard, Gonthier is cited for assertedly teaching glass strands coated with an essentially aqueous sizing composition that includes a polyurethane and a polyester. It is asserted that the polyester is produced by the reaction of a carboxylic acid and/or anhydride and a polyol as is required by claim 3. Additionally, the Examiner asserts that the polyol can be a polyalkylene glycol and the anhydride can be maleic anhydride as required by claim 4. The Examiner admits that Gonthier is silent with respect to the molecular weight of the polyester.

Das is cited for assertedly teaching a sizing composition and glass fibers sized therewith that includes one or more crosslinkable film formers as the predominant amount of the solids, an aminosilane coupling agent, and an epoxidized thermoplastic copolymer. It is asserted that the epoxidized thermoplastic copolymer can be an epoxidized polyurethane and/or an epoxidized polyvinyl acetate.

The Examiner asserts that Temple, Schell, and Das each teach sizing compositions that include a polyester, a polyvinyl acetate, and a polyurethane. With respect to the amount

of each film forming component, it is asserted that the prior art clearly teaches that sizing compositions including a combination of a polyester, a polyvinyl acetate, and a polyurethane are known. In addition, the Examiner asserts that Das teaches that it is desirable for the polyester to be present in predominate amounts. The Examiner also asserts that these teachings provide a suggestion to the skilled artisan to provide a sizing composition that contains a polyester as the predominate component. The Examiner further asserts that it is within the expected skill of one of ordinary skill in the art to arrive at the optimum proportion of the ingredients, and any improved results alleged by Applicant would have resulted from experimentation of an obvious nature.

#### **Applicants' Response**

In response to this rejection, Applicants respectfully direct the Examiner's attention to independent claims 1, 18, and 21 and submit that claim 1 defines a glass strand, claim 18 defines a sizing composition, and claim 21 defines a composite part that are not taught or suggested by Temple, Schell, Gonthier, and Das. In addition, Applicants respectfully submit that Temple, Schell, Gonthier, and Das do not teach or suggest the combination of features recited in claims 1, 18, and 21.

In the outstanding Office Action, the Examiner asserts that the combined references suggest that a mixture of film forming agents can be used and, more importantly, that mixtures of polyester, polyvinyl acetate, and polyurethane can be used. (*See* page 7, lines 3-9 of the Office Action dated December 23, 2010). Applicants respectfully disagree.

Temple teaches that in one embodiment, the aqueous curable composition can include a film forming material in addition to the antioxidant. (*See, e.g.* column 2, lines 14-21 and the Abstract). Non-limiting examples of suitable film forming materials include starches, cellulosic materials, thermoplastic materials, thermosetting materials, and mixtures thereof. (*See, e.g.* column 15, lines 39-42). Temple goes on to further teach various examples for each of the potential film forming materials, at least from line 44 of column 15 to line 67 of column 17. Although such a large list of film forming materials is identified in Temple, Temple discloses the use of only two film forming materials in the curable composition. In particular, in Example 1, the sole example in Temple, Temple teaches the use of a polyurethane and a polyester. (*See, e.g.* Table 1 bridging columns 24 and 25). Indeed, the Examiner admits that Temple teaches the use of polyurethane and polyester film forming materials in the curable composition. (*See* page 3, lines 18-20 of the Office Action dated

December 23, 2010). Applicants respectfully submit that Temple is silent regarding the use of three separate film forming materials.

Turning to Schell, Schell teaches an aqueous secondary coating that includes a urethane-containing polymer and one or more film forming materials. (*See, e.g.* column 4, lines 4-6; column 5, lines 4-8; and column 9, lines 52-55). These “additional”, optional film forming materials are identified in column 8, lines 25-39 as including aminoplasts, alkyls, epoxies, phenolics, polyamines, polyolefins, polyesters, vinyl polymers, and derivatives and mixtures thereof. Schell goes on to identify various examples for each of the potential film forming materials from line 31 of column 8 to line 55 of column 9. Although such a list of film forming materials is identified in Schell, Schell discloses the use of only one film forming material in the curable composition. In particular, as shown in Table 2 in column 20, the only example in Schell, Schell teaches the use of a sole urethane film forming agent. Indeed, Schell is silent regarding the use of three separate film forming materials as claimed in claims 1, 18, and 21.

Applicants respectfully submit that the secondary references Gonthier and Das do not provide any guidance as to the use of three separate film forming agents in a size composition. For example, Gonthier specifically teaches the use of a polyurethane and a polyester in a weight ratio of less than 3. (*See, e.g.* paragraph [0022] and the Abstract). Indeed, Gonthier teaches that very satisfactory results are obtained with a polyurethane/polyester weight ratio of less than 3. (*See, e.g.* paragraph [0033]). There is absolutely no teaching or suggestion within Gonthier of the use of more than two film forming materials in the coating composition, or the use of any other film forming materials besides a polyurethane and a polyester. Similarly, Das teaches the use of only two film forming materials. As taught in at least column 13 of Das, the size composition includes a water solubilizable unsaturated polyester resin and a water dispersible polyester resin. (*See, e.g.*, column 13, lines 42-62). Table 1 also identifies only two polyester resins as film forming agents. (*See* column 15, lines 40-43). Indeed, in each of the Examples of Das, only two film forming materials were utilized, namely, the water solubilizable unsaturated polyester resin and the water dispersible polyester resin. Nowhere in Das is there any teaching or suggestion of the use of three different film forming materials.

Applicants note that in the outstanding Office Action, the Examiner asserts that Das teaches an epoxidized thermoplastic copolymer that can be an epoxidized polyurethane and/or an epoxidized polyvinyl acetate. (*See, e.g.* page 3, lines 15-17 of the Office Action

dated December 23, 2010). The sizing composition of Das contains one or more crosslinkable film forming polymers and an interaction product of an epoxidized thermoplastic copolymer and a silane coupling agent. (See, e.g. column 3, lines 59-67). Applicants respectfully submit that the epoxidized thermoplastic copolymer is used to form the interaction product of an epoxidized polar thermoplastic polymer and is not present in the sizing composition as a separate epoxidized polar thermoplastic copolymer. Rather, it is part of the interaction product. Thus, the epoxidized thermoplastic polymer (e.g., epoxidized polyurethane and/or an epoxidized polyvinyl acetate) cannot be a potential film forming agent in Das.

It is respectfully submitted that, *at most*, the cited references teach the use of two film forming agents in a size or coating composition. Contrary to the Examiner's assertion, there is simply no teaching or suggestion within the cited references of using three separate film forming materials, particularly the use of a polyester, a polyvinyl acetate, and a polyurethane as claimed. Applicants respectfully submit that the mere disclosure within a reference of a list of film forming materials is not enough to one of skill in the art to select the three claimed film forming materials, particularly when the references themselves demonstrate the use of no more than two film forming materials. Such teachings of the use of two film forming materials within the cited references would *not* lead one of skill in the art to select three film forming materials, let alone the three claimed film forming materials in combination.

In this regard, Applicants have surprisingly discovered that the use of at least one polyurethane, at least one polyester, and at least one polyvinyl acetate within the claimed amounts provide for better cutting of the glass strand, even compared to compositions where only two of the three claimed film forming agents were used. (See, e.g. Examples on page 14-16 and page 20, lines 26-32 and Table 2 on page 20 of the application). As demonstrated in at least Examples 2-6, the use of the three claimed film forming materials exhibited an improvement in the ability of the strands to be cut compared to size compositions that contained only two of the three film forming materials. (*Id.*). Thus, the use of the three claimed film forming materials provides improved results, even when compared to the use of only two of the three claimed film forming materials, such as disclosed in the references.

In addition, in the Office Action, the Examiner asserts that a list of 10 film forming materials cannot be construed as a laundry list of film formers. (See page 6, lines 15-17 of the Office Action dated December 23, 2010). In response, Applicants respectfully submit that a list of 10 film forming agents, such as disclosed in Temple and Schell, yields over 100

possible combinations of three different film forming materials. Therefore, assuming, *arguendo*, that one of skill in the art were to attempt to choose three film forming agents from the list of film forming materials recited in Temple or Schell, there would be over 100 possible combinations to choose from. Applicants submit that such a list is indeed a laundry list of possible selections and respectfully submit that the combination of a polyester, a polyurethane, and a polyvinyl acetate cannot simply be selected such an extensive list of combinations without some suggestion or motivation provided within the reference. (*See, e.g., Manual of Patent Examining Procedure*, Patent Publishing, LLC, Eighth Ed., Rev. 6, August 2007, §2144.08). It is respectfully submitted that one of skill in the art has no reason to select the claimed combination of a polyester, a polyurethane, and a polyvinyl acetate as film forming materials based on the disclosure of Temple or Schell. Gonthier and Das provide no additional guidance for the selection of the three claimed film forming materials.

In addition, Applicants submit that there is no teaching or suggestion of the claimed ranges for each of the polyester, polyurethane, and polyvinyl acetate recited in claims 1, 18, and 21. In the outstanding Office Action, the Examiner asserts that it is within the skill of the artisan to arrive at the optimum proportion of those ingredients. (*See* page 7, lines 19-21 of the Office Action dated December 23, 2010). Applicants respectfully submit that the claimed ranges cannot be obtained by routine experimentation given the vast array of possible combination of ranges for each film forming material.

Further, Applicants submit that the teachings of the individual references cannot be overlooked. For example, Applicants submit that Temple teaches that the total amount of film forming material can be from about 0.0001 to about 99.1 weight percent of the curable composition on a solids basis. (*See, e.g.* column 18, lines 1-2). It is respectfully submitted that the teaching “from about 0.0001 to 99.1 weight percent” is simply not a sufficient teaching for one of skill in the art to arrive at the claimed ranges for the claimed polyester, polyurethane, and polyvinyl acetate. Essentially, Temple teaches a range where the film forming material can be virtually non-existent to where the film forming material comprises nearly the entirety of the coating composition. It is unreasonable to presume that it is routine experimentation for one of skill in the art to not only select the three claimed film formers from the over 100 possible combinations disclosed in Temple, but also to arrive at the claimed amounts of each of the three film formers based on the overly broad disclosed range of Temple.

In the Office Action, the Examiner asserts that Das teaches that the polyester is present in a predominant amount. (See, e.g. page 4, lines 6-9 of the Office Action dated December 23, 2010). It is Applicants understanding of the Examiner's interpretation of this teaching within Das is that the polyester is present in an amount greater than the other components (e.g., greater than 50%). Applicants respectfully submit that this is a misinterpretation of Das. Reading Das, it states that "[i]n the preferred embodiment of the present invention, the crosslinkable film forming polymer used in a predominant amount is a combination of a water soluble polyester resin having pendant and terminal carboxy functionality and a water dispersible polyester resin (emphasis added)". (See column 13, lines 4-8). What Das is asserting is that the combination of (1) a water soluble polyester resin having pendant and terminal carboxy functionality and (2) a water dispersible polyester resin is predominately used as the film forming material as opposed to some other combination of film forming materials. Das is *not* teaching that the film forming polymer is present in the composition in amounts greater than 50%. The statement relied upon by the Examiner is merely illustrating the most commonly (i.e., predominantly) used combination of film formers used in Das, and in no way teaches that a polyester is present in a predominant amount in the size composition. Indeed, it is entirely possible that the film forming material in Das is not the predominant component. For example, column 13, lines 40-62 disclose the preferred sizing composition, and in this composition, the plasticizer can be present in an amount greater than the film forming polymer material and the total amount of film forming material present is only 24%. Applicants respectfully submit that Das provides no teaching for one of skill in the art to include a polyester in an amount greater than 50%, let alone to utilize three separate film forming agents in amounts of 50 to 80% of a polyester, 10 to 40% of a polyvinyl acetate, and 8 to 15% of a polyurethane as required by claims 1, 18, and 21.

Looking now at Schell, Schell teaches an aqueous secondary coating that includes a urethane-containing polymer in an amount from about 1 to about 60 weight percent of the coating composition and one or more film forming materials in an amount from about 1 to about 20 weight percent of the coating composition on a total solids basis. (See, e.g., column 4, lines 4-6; column 5, lines 4-8; and column 9, lines 52-55). Applicants submit that the teachings of Schell must be looked upon "as a whole", and *as a whole*, Schell teaches the

inclusion of a urethane-containing polymer in an amount from about 1 to 60 weight percent.<sup>1</sup> Assuming, *arguendo*, that two other film forming polymers were present in the coating composition, the total of these two film forming polymers would have a maximum of 40 weight percent (assuming no additives or other components were present). There is no way, based on the teachings of Schell, for one of skill in the art to arrive at the claimed amounts of polyester, polyvinyl acetate, and polyurethane. One of skill in the art reading Schell would simply not envisage the use of 50 to 80% of at least one polyester, 10 to 40% of at least one polyvinyl acetate, and 8 to 15% of at least one polyurethane as claimed in claims 1, 18, and 21. Indeed, it is impossible, based on the teachings of Schell, to arrive at the use of 50 to 80% of at least one polyester, 10 to 40% of at least one polyvinyl acetate, and 8 to 15% of at least one polyurethane.

Additionally, it is respectfully submitted that one of ordinary skill in the art would have no motivation to arrive at an aqueous sizing composition that includes 50 to 80% of at least one polyester, 10 to 40% of at least one polyvinyl acetate, and 8 to 15% of at least one polyurethane based on the teachings of Temple or Schell in combination with Gonthier and Das because there is simply no teaching or suggestion within Temple, Schell, Gonthier, or Das of the inclusion of the claimed film forming agents in the claimed amounts in a sizing composition, as is discussed in detail above. Applicants submit that without some teaching or suggestion, there can be no motivation, and without motivation, there can be no *prima facie* case of obviousness.

In addition, because Temple, Schell, Gonthier, and Das do not teach or suggest a sizing composition that includes 50 to 80% of at least one polyester, 10 to 40% of at least one polyvinyl acetate, and 8 to 15% of at least one polyurethane, Applicants respectfully submit that Temple, Schell, Gonthier, and Das, alone or in any combination, fail to teach all of the claim limitations set forth in claims 1, 18, and 21. Therefore, it is submitted that a *prima facie* case of obviousness has not been established for this additional reason.

In view of the above, it is respectfully submitted that independent claims 1, 18, and 21 are not taught or suggested by Temple or Shell with Gonthier and/or Das and that claims 1, 18, and 21 are therefore non-obvious and patentable. With respect to dependent claims 2-17, 19-20, and 22-23, Applicants submit that because independent claims 1, 18, and 21 are not

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<sup>1</sup> See, e.g., *Manual of Patent Examining Procedure*, Patent Publishing, LLC, Eighth Ed., Rev. 3, August 2005, §2141.02 citing *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 218 USPQ 871 (Fed. Cir. 1983) and *Schenck v. Nortron Corp.*, 713 F.2d 782, 218 USPQ 698 (Fed. Cir. 1983).

taught or suggested by Temple or Shell in combination with Gonthier and/or Das and because claims 2-17, 19-20, and 22-23 are dependent upon claim 1, claim 18, or claim 21 and contain the same elements as the claim from which they depend, dependent claims 2-17, 19-20, and 22-23 are also not taught or suggested by Temple or Shell in combination with Gonthier and/or Das.

In light of the above, Applicants submit that 1-23 are not obvious over Temple or Shell in combination with Gonthier and/or Das and respectfully request that the Examiner reconsider and withdraw this rejection.

### **Conclusion**

In light of the above, Applicants believe that this application is now in condition for allowance and therefore request favorable consideration.

If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

If necessary, the Commissioner is hereby authorized to charge payment or credit any overpayment to Deposit Account No. 50-0568 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

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